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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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GEOFFREY E. DOBBIN, PATENT ATTORNEY
4278 SOUTH 6220 WEST
WEST VALLEY CITY, UT 84128-6501

EXAMINER	
MAY, ROBERT J	

ART UNIT	PAPER NUMBER
2885	

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01/22/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/774,346	CAO ET AL.	
	Examiner	Art Unit	
	Robert May	2885	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,7-9,12,17-19 and 22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,7-9,12,17-19 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 2, 2008 has been entered.

Affidavit under 37 CFR 1.132

The affidavit under 37 CFR 1.132 filed September 4, 2007 is insufficient to overcome the rejection of the claims based upon Hochestein, Hartley, Koehler, Kamakura and Kish as set forth in the last Office action because:

An affiant who is asserting commercial success to support its contention of nonobviousness bears the burden of proof of establishing a nexus between the claimed invention and evidence of commercial success and the PTO must rely upon the applicant to provide hard evidence of commercial success. In this particular case, the affiant has not provided any real objective evidence showing commercial success based upon the invention claimed (See MPEP 716.02(f)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4, 7-9, 12, 17-19, & 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanley in view of Hochestein, Hartley, Koehler, Kamakura (5,578,156) and Kish (5,793,062).

Regarding Claims 1, 12 and 22 Hanley discloses in Figure 13 a light which could be used by a miner having forward illumination using semiconductor chips 1330 and a remote power source 1350 that is of a non-sparking nature so that the apparatus can be worn by a firefighter when entering flammable combustible environments (Col 10, Lines 38-42).

Hanley fails to disclose a semiconductor chip mounted to heat sink comprising a primary and a dissipating or secondary heat sink with the latter having an internal volume greater than the primary heat sink and a heat dissipation geometry.

Hochstein discloses in Figure 2, an LED 12 affixed to a primary heat sink 18 which is attached to a heat dissipating heat sink 32, 30 where the dissipating heat sink is configured as fins 32 where the dissipating heat sink 32, 30 has a greater internal volume than primary heat sink 18 with a heat dissipation geometry (fin shaped) in order to maintain the light output of the LED package when the LED apparatus is used in

critical situations where the reduction in luminous output can have dire consequences (Col 1, Lines 38-43) such as within a flammable mine environment.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the LEDs of Hanley's front illuminating fireman's helmet with the LED heat sink assembly of Hochstein so that illumination of the LEDs can be maintained in critical safety situations.

Hanley fails to disclose a wavelength shifting coating on the chip for converting the monochromatic light emitted to white light.

Hartley discloses a flashlight wherein the LED is coated with a phosphor coating which acts to convert the emitted light to a white light (Col 14, Lines 1-3) in order to produce a white light for general illumination purposes.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the LEDs of Hanley with a phosphor coating to produce a white light for general illumination purposes.

Regarding Claim 1, Hanley discloses a remote power source 1350 which is construed as a battery located on a remote location from the light source 1330 on the helmet, but fails to disclose this as a battery pack with a battery sealed within.

Koehler discloses in Figures 1 & 6, a waterproof battery and lamp apparatus where the battery is sealed within case 15 so as to avoid exposure of the battery to a wet environment such as mining environment.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the remote battery of Hanley with a battery pack

sealing the battery within as disclosed by Koehler so as to prevent exposure of the battery to a wet environment such as a mining environment.

Regarding Claims 1, 12 and 22 Hanley fails to disclose the semiconductor chip including epitaxial layers located on a substrate made from a material selected from a group consisting GaAs, ZnS, ZnSe, InP, Al2O3, Sic, GaSb, and InAs.

Kamakura discloses a light apparatus comprising a light module including a semiconductor material including a chip which includes epitaxial layers located on a substrate made from GaAs, InP for emitting the light at a particular wavelength (Col 1, lines 13-18 and Col 3, lines 53-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the light module of Hanley with the semiconductor chip having epitaxial layers located on a substrate made from GaAs or InP for emitting the light at a particular wavelength.

Regarding Claims 1, 12, and 22, Hanley fails to disclose an airtight magnetic switch for activating the light source.

Koehler discloses in Figures 1 and 6, an air and water tight switch mechanism a lighting apparatus having an electrically conductive ferromagnetic element shiftable in a capsule which shifts in response to the shifting of a magnetic switch (Col 2, Lines 48-52) that protects the circuitry from a wet environment such as within a mining environment.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the switch of Hanley with magnetic switch of Koehler so that the circuitry is protected from a wet environment.

Regarding Claims 1, 7, 12, 17 and 22, Hanley fails to disclose a reflector in the light module or a light reflective adhesive between the semiconductor chip and the primary heat sink.

Kish discloses in Figure 2 a reflector comprising a silver loaded reflective epoxy which affixes an LED to a reflector cup in order to reflect the light from the LED's back surface and improve the intensity of the light (Col 3, Lines 65+).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the integrated LED heat sink of Hanley, Hochstein, Hartley and Koehler with the reflector comprising a reflective epoxy of Kish in order to improve the intensity of the light emitted.

Regarding Claims 1, 12 and 22, Hanley fails to disclose a device with a heat sink assembly where there is heat conductive adhesive or agent between the primary and dissipating heat sinks.

Hochstein discloses a heat sink for an LED with the heat sink assembly as recited in Claims 1 & 12 and the use of a conductive epoxy adhesive or agent to bond the primary heat sink 18 to heat sink dissipater 32, 30 as a practical means for thermally coupling heat sinks together (Col 5, Lines 13-16).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use conductive adhesive or an agent as taught by Hochstein to thermally couple the heat sinks together. All the claimed elements in Hanley and Hochstein were known in the prior art and one skilled in the art could have combined the thermally conductive adhesive or agent of Hochstein with Hanley as claimed with no change in

their respective functions, and the combination would have yielded the predictable result to one of ordinary skill of thermally coupling the two heat sinks together See *KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (2007).*

Regarding Claims 8 & 18 Hanley fails to disclose the light source 1330 as being either (LED chips, LED Chip arrays, laser diodes, vertical cavity surface emitting lasers, VCSEL arrays, edge emitting lasers, surface emitting lasers and photon recycling devices.

Hochstein discloses in Figure 2 an LED chip 12 that is suitable for mounting to a heat sink as disclosed.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the LED of Hanley with the LED chip of Hochstein so that in can be mounted to a Heat sink surface.

Regarding Claim 9 and 19 Hanley fails to disclose heat sinks wherein one of said heat sinks includes material selected from the group consisting of copper, aluminum, silver, magnesium, steel silicon carbide, born nitride, tungsten, molybdenum, cobalt, chrome, Si, SiO2, SiC, AlSi, AlSiC, and diamond.

Hochstein discloses using a plated copper diamond material for drawing heat away from an LED die (junction) to a heat dissipater to reduce the temperature and extend the life of the LED Package (Col 1, Lines 55-58).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Hanley with a heat sink assembly

comprising copper plated diamond so that heat may be drawn away from the LED die (junction) to the heat dissipater.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hanley, Hochstein, Hartley, Koehler, Kamakura and Kish as applied to claim 3 above, and further in view of Parker.

Hanley fails to disclose a strap for securing the battery packs on opposite sides of said helmet.

Parker discloses in Figure 4, a device comprising a battery 15 strapped to the helmet using a strap 17 that can strap the two batteries to opposite sides of the helmet.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a strap as taught by Parker for strapping two batteries to opposite sides of the helmet.

Response to Arguments

Applicant's arguments filed April 22, 2007 have been fully considered but they are not persuasive.

In response to applicant's argument that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert May whose telephone number is (571) 272-5919. The examiner can normally be reached on Mondays through Fridays 9am-12pm & 1-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong-Suk (James) Lee can be reached on (571) 272-7044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RM
1/15/08

JONG-SUK (JAMES) LEE
SUPERVISORY PATENT EXAMINER